

REMARKS/ARGUMENTS

Reconsideration is respectfully requested.

Claims 1-9 are pending before this amendment. By the present amendment, claims 7-9 are canceled without prejudice and claims 1-3 are amended. No new matter has been added.

In the office action (page 2), the title of the invention is objected to because it is not descriptive. In response, the applicant has amended the title to recite "XML PROCESSOR AND XML PROCESSING METHOD IN SYSTEM FOR XML PARSING HAVING THE XML PROCESSOR FORMED OF INDEPENDENT HARDWARE TO REDUCE PROCESSING TIME FROM THE XML PARSING". Accordingly, the applicants respectfully request withdrawal of the objection.

In the office action (page 2), the drawings stand objected to because they include reference characters not mentioned in the description and also branches 66 and 67 of FIG. 11 stand objected for lacking a conditional branch. In response the applicants have provided a substitute specification clarifying the present invention and to address each and every concern related to the drawings as specified by the examiner. The applicants submit that no new matter has been added by the amendments to the specification, instead the amendments to the specification merely clarify the present invention with the associated replacement drawings. Also, the applicants are attaching the corresponding annotated and replacement drawing for FIG. 11 in the appendix of this response based on the amendments to the specification for the associated replacement drawing of FIG. 11. Therefore, the applicants respectfully request that this

objection to the drawings be withdrawn.

In the office action (page 4), the specification stands objected to because of informalities relating to incorrect reference characters described in the specification as pointed out by the examiner. In response, the applicants have amended the specification as suggest by the examiner. Therefore, the applicants respectfully request that this objection to the specification be withdrawn.

In the office action (page 4), claims 2 and 3 stand objected to for being indefinite for having "i.e." and "and the like" in the claims. In response, the applicants have amended claims 2 and 3 to delete the "i.e." and "and the like" in their respective claim. Therefore, the applicants respectfully request that this objection to claims 2 and 3 for being indefinite be withdrawn.

103 Rejections

In the office action (page 5), claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 7,013,424 (James) in view of U.S. Patent No. 7,305,615 (Ross).

In the office action (page 7), claims 3 and 4 stand rejected under 35 U.S.C. §103(a) as being obvious over James in view of Ross and further in view of U.S. Patent No. 6,938,204 (Hind).

In the office action (page 9), claims 5 and 6 stand rejected under 35 U.S.C. §103(a) as being obvious over James in view of Ross and further in view of U.S. Patent No. 7,080,094 (Dapp).

In the office action (page 11), claims 7-9 (which is now moot since claim 7-9 have been cancelled) stand rejected under 35 U.S.C. §103(a) as being obvious over James in view of U.S. Publication No. 2005/0034032 (Uchida) in view of Dapp.

The applicants have amended claim 1 to clarify the presently claimed invention over the prior art and to traverse the examiner's rejection.

Comments for 103 Rejections

The present invention relates to XML (extensible mark-up language) processing by parsing, and more particularly, to a separate and independent XML processor not part of the conventional software parsing of the received XML document in which a part of XML processing is performed by a hardware to not only reduce load of system but also improving an XML processing speed. Also, the presently claimed invention relates to an XML processing method in a system having the separate and independent XML processor from the software XML for processing a received XML document. As shown in FIG. 1 of the presently claimed invention, FIG. 1 discloses a schematic diagram illustrating operations of an XML processor and conventional generalized XML parser based on software. As shown in FIG. 1, an XML processor 13 performed by the hardware according to the presently claimed invention and software-based conventional generalized XML parsers 11 not performed by hardware are both able to receive and process the same input XML document 10 and generate the same product 12, where when the processing of the receive input XML document by XML processor 13, the XML processing time due to parsing is reduced over the software-based conventional generalized XML parsers 11 not having the claimed hardware.

Generally, the prior art software-based conventional generalized XML parsers

are viewed as a software library used to facilitate manipulation of XML documents. Most conventional XML parsers are configured to be compatible with XML grammar. However, a significant drawback of the conventional XML parsers is that such conventional parsers require relatively large software components, which causes load of a system that processes the increase uses from receiving XML documents through the internet, where the Internet has increased the receipt of XML document due to increase of data from the information-oriented era. In particular, usage of web has been rapidly increasing in a variety of embedded systems, such as cellular phones, digital home electronics, telematics terminals, PDAs (Personal Digital Assistant), web TVs, and the like, besides typical PCs. However, these embedded systems typically have limited computing power and memory capacity, when being compared to say for example a PC. As a result, the software-based conventional XML parsers of the prior art are generally not suitable for use in embedded systems.

In contrast, the presently claimed invention discloses an efficient hardware based XML parsers for reducing the time required to parse XML documents through programming, which is better suited for these non-PC-based devices in order to reduce the loads put on these non-PC based devices when performing XML processing in theses non-PC-based devices.

Accordingly, the presently claimed invention provides an XML processor in which a part of software-based XML processing is performed in a hardware manner based on independent hardware, thereby improving an XML processing speed when being compared to only conventional software-based processing/parsing of an XML document(s). Thus, the presently claimed invention also provides an efficient method

for XML processing in a device comprising a hardware-based XML processor and a software-based XML processor.

Further, the presently claimed invention provides a CPU for controlling the XML processing on a received XML document by the software stored in the first memory, which generates a first output if the XML is executed by the software-based conventional generalized XML parsers, and to generate a second output if the part of the software-based XML processing is performed in the hardware manner as disclosed by the presently claimed invention such that the first and second outputs are equivalent and when the part of the software-based XML processing is performed in the hardware manner as disclosed by the presently claimed invention, the processing time done of a received XML document is reduced over the excluding software-based conventional generalized XML parsers (i.e.; the examiner's cited references of James only discloses a software-based program for parsing an XML document **with out** having any independent hardware to perform any part of the software-based parsing of the XML document).

Claim 1 has been amended to clarify this above described novel aspect of the presently claimed invention, which recites inter alia:

--receiving an XML document:

a first memory storing software for performing an XML processing, variables, and values required to execute software **on the received XML document;**

a hardware processing module performing a part of the XML processing in a hardware manner **on the received XML document, and wherein the hardware processing module is separate and independent of the first memory storing having the software for performing the XML processing;**

a second memory employed by the hardware processing module; and

a CPU controlling the XML processing **on the received XML**

document by the software stored in the first memory to generate a first output if the XML is executed by software, and to generate a second output if the part of the XML processing is performed in the hardware manner.

wherein the XML processing time is reduced from the hardware processing module performing the part of the XML processing in the hardware manner, and
wherein the first and second outputs are equivalent--.

The Applicants respectfully submit that the cited references do not describe, teach, or suggest all of these limitations recited in amended claim 1. That is, nowhere in James nor Ross nor Dapp, neither alone or in combination, discloses or suggests relates to XML (extensible mark-up language) processing by parsing, and more particularly, to a separate and independent XML processor not part of the conventional software-based parsing of the received XML document in which a part of XML software-based processing is performed by a hardware to not only reduce load of system but also improving an XML processing speed.

Accordingly, the applicants respectfully submit that James, Ross, and Dapp are silent for teaching the following: receiving an XML document by an software-based XML parsers having a first memory storing software for performing an XML processing, variables, and values required to execute software on the received XML document, and **by a hardware processing module performing a part of the XML processing in a hardware manner on the received XML document, wherein the hardware processing module is separate and independent of the first memory storing having the software for performing the XML processing**, wherein a CPU controls the XML processing on the received XML document by the software stored in the first memory for generating a first output if the XML is executed by software, and to generate

a second output if the part of the XML processing is performed in the hardware manner and wherein the first output from only software and second output from software and hardware performing part of the software are equivalent with a reduction in XML processing of an XML document when being compared the processing time of the conventional software-based parsing of a received XML document. Thus, the applicants respectfully submit that claims 1-6 should now be in condition for allowance.

In contrast, the applicants respectfully state that James only relates to having a special purpose processor 432, which is only used for offloading the processing of a received XML document that would of generally been done by a local general purpose processor. The applicants respectfully point out that the special purpose processor 432 is **only** a software-based XML parser **with out** any independent and separate hardware performing any part of the software-based XML parsing on a received XML document in James for decreasing the XML parsing time on the received XML document over the software-based XML parsing used in James (James Abstract; page 3, lines 21-42; page 6, lines 48-56; and col. 7, lines 62-63, col. 8, lines 8-10, and col. 10, lines 48-61 for James' special purpose processor being only software based without any mention of hardware performing any part of the software parsing of a received XML document).

In contradistinction, FIG. 4 of the presently claimed invention illustrates an XML processor performing part of the software-based XML processing/parsing by hardware as follows:

"An XML processor 13 shown in FIG. 4 comprises a CPU 40 that generally controls the XML processor 13, a memory 41 that stores software for performing a specific function of the CPU 40, variables, and values required to execute software instructions, a hardware processing module 42 that performs a part of XML processing in a hardware manner, and a memory 43 used in the hardware processing module 42.

A bus 44 that receives and transmits data connects the above components.

FIG. 4 shows that a specific function among the XML processing functions can be realized in a **hardware manner**. For example, a memory management function used in parsing, i.e., processing of assigning, returning, and reassigning memory, influences the most the performance of software parsers.

Referring to FIG. 4, the **XML processor according to the embodiment of the present invention can realize the memory management function in a hardware manner in order to improve the performance of XML processing**. The XML processor according to the embodiment of the present invention can realize an XML DTD and a state machine with respect to an XML schema, which are frequently used in XML processing, in a hardware manner, in addition to the memory management function",

(specification page 4, lines 6-23 and FIGs. 4-8 [**emphasis added**]).

As described above, the presently claimed invention provides an XML processor in which a part of software-based XML processing/parsing is performed on a received XML document in a hardware manner based on independent hardware, which is separate from the software-based processing of the XML document, and which this software with part of the software being performed by hardware is able to generate a same output as if the received XML document was completely processed by the conventional software-based XML processing. Thereby, the software with part of the processing of an XML document by hardware disclosed by presently claimed invention improves an XML processing speed done only by software and reduces computational load (i.e.; eliminates software processing of an XML document) of a system for using the convention software-based XML processing on a received XML document when being compared to only a software-based XML processing on a received XML document as disclosed by James. Ross and Dapp fail to make up for the deficiency of James.

Therefore, the applicants respectfully submit that nowhere does James nor Ross, nor any of the examiner's cited references, neither alone nor in combination, disclose or suggest each and every one of the limitations of amended claim 1 recited above.

DEPENDENT CLAIMS

The other claims are dependent from independent claim 1 discussed. Thus, the remaining dependent claims are therefore believed patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

For the reasons set forth above, the applicants respectfully submit that claims 1-6 now pending in this application, are in condition for allowance over the cited references. Accordingly, the applicants respectfully request reconsideration and withdrawal of the outstanding rejections and earnestly solicit an indication of allowable subject matter.

This amendment is considered to be responsive to all points raised in the office action. Should the examiner have any remaining questions or concerns, the examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully submitted,

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APPENDIX OF ATTACHMENTS

**Replacement Sheets of FIGs. 8 - 11
(a total of 3 sheets of drawings)**

and

**Annotated Sheets Showing Changes of FIG. 8 - 11
(a total of 3 sheets of drawings)**